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1953 Improvement of A-1 Aerial Training
Devices

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1. The control mechanisms of the A-1-p aerial training devices manufactured for the Russians in 1953 by VEB Carl Zeiss, Jena, differ from those of the 279 devices delivered by the firm to the Russians during and prior to 1952. Ivtshenko (fnu), head of the 1953 Russian acceptance commission at the Zeiss firm, stated that the Russians were interested in obtaining an improved control mechanism for the 279 devices delivered during and prior to 1952. He recommended that the Zeiss firm approach the Russian Engineering Administration in the Soviet Trade Delegation, Berlin, with an offer to deliver the improved control mechanism for the A-1-p sets which are now provided with the old-type mechanisms. The Zeiss firm thereupon decided to make an offer for 300 improved control mechanisms with accessories. They are to be delivered as a special supplement order to the deliveries made prior to the end of 1952.
2. In the Zeiss offer to the Engineer Administration, which is to be made prior to 31 December 1953, the following points are stressed (at Ivtshenko's recommendation). They may give an inkling of the improvement of the control mechanism carried out in 1953:
 - a. The control stick installations (Knueppelsteuerungen) installed in the devices during the 1950 and 1952 construction programs had a number of structural and functional shortcomings. The functional shortcomings hampered the operation of the device. The discrepancy between the rotation moment characteristics and natural flight conditions (die den natuerlichen Flugverhaeltnissen widersprechende Drehmomentcharakteristik) was the most important functional shortcoming.
 - b. The control stick installation had a very strong mechanical stabilizing mechanism (Fixierung) in the command zero position, which served the purpose of fixing securely (sicherstellen) the electrical values (Ausgangswerte) of the zero position. This strong stabilization hampered operations severely, since during a flight most of the commands are given around the zero position. The improved 1953 construction eliminates this shortcoming and has a number of other technical advantages which have an essential effect on the stability of the command functions and on the duration of the construction parts.

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c. The advantages of the 1953 construction over that of 1950 and 1952 can be summed up in the following points:

- 1) Essential improvement of the rotation moment characteristics and, as a result, better approximation of actual flight conditions. Movement of the control mechanism (Steuerorgan) around the zero position results in a rotation moment of 0.2 to 0.5 kilograms, whereas the old version had a rotation moment of two kilograms.
- 2) Transitions in the mechanical zero position are almost completely free of jamming, (Nahezu gaenzlich rastfreier Uebergang in der mechanischen Nullage).
- 3) The advantages listed in points 1 and 2 were obtained by installing ball bearings and improving the distribution of pressure without hampering the electrical zero position; they were also achieved by using eight springs instead of four springs, as in the old version.
- 4) Use of two potentiometers of 100 Ohms in parallel connection, instead of one potentiometer (Stabpotentiometer). As a result, development of heat could be reduced by 30 percent.
- 5) Use of pressure springs instead of flat springs (Plattfedern). The uniformity of contact pressure (Schleiferdruck) over the entire potentiometer was thus considerably increased.
- 6) Better possibilities of adjusting the contacts through spindle adjustments (Verstellung der Spindeln).

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